**REMARKS**

In the Office Action mailed November 1, 2007, the Examiner noted that claims 1-20 and 22-36 were pending, allowed claims 18-20, 22, 31, 34 and 35, objected to claims 11-17 and rejected claims 1-10, 23-30, 32, 333 and 36. Claims 1, 11, 24-30 and 32 have been amended and, thus, in view of the forgoing claims 1-20 and 22-36 remain pending for reconsideration which is requested. No new matter has been added. The Examiner's rejections and objections are traversed below.

In the Office Action, on page 5, the Examiner objected to claims 11-17 and indicated that these claims would be allowable if rewritten into independent form. These claims have been so rewritten and it is submitted that these claims have not been narrowed and have the same scope as prior to being made independent and are now allowable. Withdrawal of the objection is requested.

In the Office Action, on page 2, the Examiner rejected claims 1-10, 32 and 33 under 35 U.S.C. section 101 as non-statutory. In particular, the Examiner asserted that the claims are directed towards nonfunctional descriptive material with no functionality present to provide a practical application. The claims have been amended in consideration of the Examiner's comments and it is submitted they satisfy it satisfies the requirements of the statute. Withdrawal of the rejection is requested.

In the Office Action, on page 3, the Examiner rejected claims 24-26 under 35 U.S.C. section 112 paragraph 2 as indefinite. The claims have been amended in consideration of the Examiner's comments and it is submitted they satisfy the requirements of the statute. If additional concerns with the claims arise, the Examiner is invited to telephone to resolve the same. Suggestions by the Examiner are also welcome. Withdrawal of the rejection is requested.

On page 3 of the Office Action, the Examiner rejected claims 23, 27-30 and 36 under 35 U.S.C. § 102 as anticipated by Sachs. The Examiner focuses his comments about Sachs on columns 15 and 16 and part of column 20.

Sachs is about determining whether a designed object can be machined from a single slab of material by determining whether a void exists inside the object and if so sectioning the object so that it can be machined. To do this, Sachs projects a ray for each object facet through the object and counts the number of intersections with the surfaces of the object. If there are more than two intersections, the object cannot be made from a single slab.

Claim 23 calls for "to automatically determine an intersection order or rank of one or more intersections". That is, a rank or order of the intersections is determined. In contrast, as noted above, Sachs just counts the number of intersections. There is no need for Sachs to determine an intersection rank or order and Sachs does not suggest such because a void can be detected by merely counting intersections. Determining the rank can be very important for applications like 3D paint (where the user may want to lock the paining to the third layer of a convoluted surface) or transparency approximation (when the user can decide to have only the first 4 layers of a semitransparent object contribute to the final image for performance reasons) where none of those applications would be possible using Sachs. Withdrawal of the rejection of claim 23 is requested.

With respect to claims 27-30, these claims call for determining whether a ray intersection is occluded so that the outermost intersection can be determined. The Examiner looks to Sachs at col. 20, lines 21-48, where there exists a discussion about rendering hidden surfaces, for teachings with respect to occlusion. Sachs is about finding whether a tool can reach a designed surface so that a slab of material can be machined into a desired shape. While Sachs does, in a certain sense, relate to determining whether something is occluded or hidden, Sachs does not determine whether the "second intersection" is occluded and has found the outermost intersection on an object or the one closest to the source of the ray. Sachs does not make such a rank order determination because, as discussed above, order of intersection is not important to Sachs. For this reason, the rejection of claims 27-30 should be withdrawn.

Claims 27-30 are also about a method where a first intersection computed previously is used to accelerate the computation of a second intersection. Sachs computes an acceleration structure once for the object, and then computes each intersection independently. In these claims, the information about the first intersection is used in order to determine the second. In particular, "finding, based on the first intersection, a second intersection between the ray and the mesh object based on the moving of the ray or the mesh object". Sachs does not teach or suggest this. For this additional reason, the rejection of claims 27-30 should be withdrawn.

Claim 36 calls for finding an intersection by using a tessellation that is located "between an outer bounding surface and the original mesh surface. This tessellation is a special data structure. The Examiner looks to Sachs at col. 16, lines 13-17 for this feature where the term "bounding box" is used in a discussion of figure 18. However, figure 18 shows nothing and this discussion says nothing about such an in-between tessellation. The only figure of Sachs that uses a special data structure is figure 16 that shows an octree. An octree is not a tessellation.

The method of claim 36 uses a tessellation (that can be made of tetrahedrons for surfaces in 3D space or higher dimensions). Using a tessellation that is between and can connect a surface of dimension to an outer bounding surface of dimension is not described or suggested in Sachs. Withdrawal of the rejection of claim 36 is requested.

It is submitted that claims 23, 27-30 and 36 patentably distinguish over Sachs and withdrawal of the rejection is requested.

It is submitted that the claims satisfy the requirements of 35 U.S.C. sections 101 and 112. It is also submitted that claims 18-20, 22, 31, 34 and 35 continue to be allowable. It is further submitted that the claims are not taught, disclosed or suggested by the prior art. The claims are therefore in a condition suitable for allowance. An early Notice of Allowance is requested.

If any further fees, other than and except for the issue fee, are necessary with respect to this paper, the U.S.P.T.O. is requested to obtain the same from deposit account number 19-3935.

Respectfully submitted,

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